“SHIP BUILDING IN INDIA”

Project Report submitted in partial fulfilment for award of the degree of

Master of Business Administration (MBA)

International Transportation and Logistics Management

by

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Under the guidance of

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DECLARATION

I, **NIKESH R** bearing Register Number: **2103305031**, student of MBA – International Transportation & Logistics Management, at School of Maritime Management, Indian Maritime University, Chennai Campus, hereby declare that the project report titled **"SHIP BUILDING IN INDIA"** is my original work. This report is being submitted in partial fulfilment of the requirement for the award of the degree of Master of Business Administration (MBA) In International Transportation and Logistics Management (ITLM). The project report is output of my learnings and observations of my research under the guidance of Dr M. Sekar, Assistant professor School of Maritime Management, Indian Maritime University, Chennai Campus.

I declare that the information submitted is true and original to the best of my knowledge.

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CERTIFICATE

This is to certify that this project report entitled **"SHIP BUILDING IN INDIA"**- submitted to the School of Maritime Management, Indian Maritime University, Chennai Campus in partial fulfilment of the requirement for awarding the degree, MBA in International Transport and Logistics Management is a genuine work of **NIKESH R (Reg No. 2103305031)**.

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Last but the least my prayers and thanks to the “almighty” without whom the work would not have been materialized.

Place: Chennai **NIKESH R**

Date:

EXECUTIVE SUMMARY

The project titled "Shipbuilding in India" aims to explore the opportunities and challenges associated with the shipbuilding industry in India. India's strategic geographic location, expanding economy, and growing maritime activities have created a favourable environment for the development of a robust shipbuilding sector. This executive summary provides an overview of the key findings and recommendations from the project.

India's shipbuilding industry has witnessed significant growth in recent years. The country's extensive coastline, ports infrastructure, and skilled workforce have positioned it as a competitive player in the global shipbuilding market. The analysis indicates a rising demand for various types of vessels, including commercial ships, naval vessels, offshore structures, and specialized vessels for the oil and gas industry. The domestic market, as well as international markets, present lucrative opportunities for Indian shipbuilders.

Here the study has done on the statistics for ship building industry in India Includes no. of ships ordered and delivered for the last 5 years by the Indian private and public sector companies.

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CHAPTER 1

INTRODUCTION

1.1 MEANING AND DEFINITION

Shipbuilding is the process of designing and constructing ships, including everything from small fishing boats to enormous cargo vessels and cruise ships. It is a complex and multi-disciplinary field that requires a range of skills and expertise, including naval architecture, marine engineering, and materials science.

The history of shipbuilding dates back thousands of years, with evidence of ancient civilizations constructing boats and ships for transportation, fishing, and warfare. However, it was during the industrial revolution that shipbuilding became a major industry, with the development of new technologies and materials enabling the construction of larger and more complex vessels.

Figure 1.1: Ship yard

The shipbuilding process typically begins with the design phase, where naval architects use computer-aided design (CAD) software to create detailed plans for the vessel. These plans take into account a range of factors, such as the ship's intended use, its size and shape, and the materials that will be used in its construction.

Once the design is finalized, construction can begin. The first step is to build the ship's frame, which is typically made from steel or aluminium. The frame provides the basic structure for the ship, and is constructed using a combination of welding and riveting techniques.

Once the frame is in place, the ship's hull can be constructed. The hull is the outermost layer of the ship, and is designed to be strong and watertight. Depending on the size and shape of the vessel, the hull may be constructed using a single piece of steel or aluminium, or may be made up of multiple sections that are welded together.

After the hull is complete, the ship's propulsion system can be installed. This typically includes engines, propellers, and other equipment necessary to power the vessel. In addition, the ship's electrical and plumbing systems are installed at this stage.

Once the ship is fully constructed, it undergoes a series of tests to ensure that it is seaworthy and meets all safety standards. This may include tests of the ship's stability, manoeuvrability, and speed, as well as tests of its safety equipment and emergency procedures.

Shipbuilding is a highly specialized field that requires a range of skills and expertise. Naval architects are responsible for designing ships that are safe, efficient, and functional, while marine engineers are responsible for ensuring that the ship's propulsion and other systems are reliable and efficient. Materials scientists play an important role in selecting the right materials for the ship's construction, taking into account factors such as weight, strength, and corrosion resistance.

In addition to these technical skills, shipbuilding also requires a range of other skills, such as project management, teamwork, and communication. Building a ship is a complex process that requires the coordination of many different workers and departments, and effective communication and collaboration are essential to ensure that the project is completed on time and within budget.

Shipbuilding is a global industry, with shipyards located around the world. Some of the largest shipbuilding countries include China, South Korea, and Japan, which are known for their advanced technologies and highly skilled workforces. In addition to these countries, shipbuilding also takes place in Europe, North America, and other regions around the world.

Overall, shipbuilding is a complex and highly specialized field that plays an important role in global trade and transportation. From small fishing boats to massive cargo vessels, ships are

essential for transporting goods and people around the world, and shipbuilding is an essential industry that helps to ensure that these vessels are safe, efficient, and reliable.

1.2 SHIP BUILDING TRENDS

The shipbuilding industry has undergone significant changes and trends in recent years, driven by a range of factors such as advancements in technology, changing global economic conditions, and evolving regulatory requirements.

One of the most significant trends in shipbuilding is the increasing use of digital technologies and automation. Shipbuilders are increasingly relying on computer-aided design (CAD) and other digital tools to design and plan ships, as well as using automation and robotics to improve efficiency and reduce costs in the construction process.

Another important trend is the increasing demand for environmentally friendly and energy-efficient ships. In response to growing concerns about climate change and air pollution, shipbuilders are developing new technologies and materials to reduce emissions and improve energy efficiency. This includes the use of hybrid and electric propulsion systems, as well as the development of lighter and stronger materials that can improve fuel efficiency and reduce emissions.

In addition, there is a growing trend towards larger and more complex ships, particularly in the container shipping and cruise industries. This has driven innovation in shipbuilding and engineering, as designers and builders work to create vessels that are both larger and more efficient, while still maintaining high levels of safety and reliability.

Another important trend is the increasing use of modular construction techniques. Modular construction involves building ship components and modules in a factory or workshop, and then assembling them on-site. This can improve efficiency and reduce costs, as well as providing greater flexibility in the construction process.

Finally, there is a growing focus on safety and quality in shipbuilding. In response to a number of high-profile accidents and incidents in the industry, shipbuilders and regulators are placing greater emphasis on safety and quality management systems, with a particular focus on risk management and prevention.

Overall, the shipbuilding industry is undergoing significant changes and trends, as designers and builders work to meet the evolving needs of customers and regulators, while also addressing growing concerns about sustainability and safety.

1.3 OBJECTIVES

Primary objectives:

- To study the shipbuilding business in India.

Secondary objectives:

- To study the 2 different aspects of shipbuilding companies namely private sector and public sector companies.
- To study the business statistics such as order received, delivered ships in public and private sector companies
- To study the capacities of the companies.
- To study the importance of shipbuilding in India.
- To list out the findings from the above study.

1.4 SCOPE OF THE STUDY

- This study analyses the present business conditions in India with private and public sectors ship building.

1.5 RESEARCH METHODOLOGY

- The data has been collected from the secondary sources from Ministry of Ports, Shipping ∧ Waterways. The data has collected for 5 years (2017-18 to 2021-22) for the study. The researcher has used simple percentage analysis and correlation for the study.

1.6 DATA COLLECTION

Secondary Data

- Administration reports or Annual reports
- Indian port association official website.
- Ministry of Ports, Shipping and Waterways official website.

- Books, magazines and newspaper.
- Various publications of the central, state and local government.
- Technical and trade journals.
- Official government websites.

1.7 LIMITATIONS

The limitations of the research are as follows:

- Limited time span of the project.
- Sources for collecting data were very limited.
- The research is limited to the availability of data which was not provided from higher officials.
- The accuracy of data is limited due to non-working of many nonmajor ports.
- Some of the data are also not available due to security reasons.

CHAPTER 2
LITERATURE REVIEW

2.1 REVIEW LITERATURE

PAPER 1

Review of Global Naval Shipbuilding Trends and Lessons for Indian Shipbuilding Industry

This paper provides a review of global naval shipbuilding trends and identifies lessons for the Indian shipbuilding industry. The study examines factors such as market demand, technology adoption, and government policies that have contributed to the success of shipbuilding industries in other countries. The findings offer insights for policymakers and industry leaders in India to enhance competitiveness and increase global market share.(Kulkarni, n.d.)

PAPER 2

SWOT Analysis of China Shipbuilding Industry by Third Eyes

This paper presents a SWOT analysis of the shipbuilding industry in China, examining its strengths, weaknesses, opportunities, and threats. The study analyses factors such as market demand, technological capabilities, government policies, and international competition, providing insights into the current state and future prospects of the Chinese shipbuilding industry.(Hossain et al., 2017)

PAPER 3

Shipbuilding at Bombay

This paper provides a historical overview of shipbuilding in Bombay, India, from its origins in the 18th century to the modern era. The study examines the growth and decline of the industry, the technological advancements, and the impact of government policies and international trade on the shipbuilding sector in Bombay.(Kochhar, n.d.)

PAPER 4

Competitiveness of Indian Ship Building Industry

This paper examines the competitiveness of the Indian shipbuilding industry by analysing factors such as market demand, infrastructure, policy support, and technological capabilities. The study identifies areas for improvement, such as enhancing R&D activities and developing a skilled workforce, to increase the industry's competitiveness and attract more global orders.(*Competitiveness of Indian Ship Building Industry*, n.d.)

PAPER 5

Foreign Direct Investment and the Shipbuilding Industry: A Bangladesh Perspective

This paper examines the impact of foreign direct investment (FDI) on the shipbuilding industry in Bangladesh. It explores the potential benefits and challenges of FDI for the industry's development and analyses the government's policies and strategies to attract FDI in this sector. The study provides insights for policymakers and investors interested in this industry.(Hasan et al., 2017)

PAPER 6

Value Engineering to Rework Reduction in Ship Building Project

This paper presents the application of value engineering (VE) techniques to reduce rework in shipbuilding projects. It highlights the importance of VE in optimizing costs, improving quality, and reducing project duration. The study provides insights into the effective implementation of VE for the shipbuilding industry.(Desai et al., n.d.)

PAPER 7

Energy consumption and convention in shipbuilding

This paper discusses the challenges and opportunities for energy conservation in shipbuilding. It highlights the importance of energy efficiency in reducing operating costs and environmental impact. The study presents various strategies and technologies for energy conservation in ship design and operation, providing insights for the shipbuilding industry.(Harish & Sunil, n.d.)

PAPER 8

Present Scenario of Ship Building Industry in Indian

This paper provides an overview of the current status of the shipbuilding industry in India. It discusses the industry's strengths, weaknesses, opportunities, and threats, and analyses the government's policies and initiatives to promote its growth. The study provides insights for stakeholders interested in the Indian shipbuilding industry.(Associate Professor, n.d.)

PAPER 9

The Use of Copper and Lead Sheathing in VOC Shipbuilding

This paper explores the use of copper and lead sheathing in shipbuilding during the VOC (Dutch East India Company) period. It discusses the benefits and drawbacks of these materials and their impact on ship durability and maintenance. The study provides insights into historical

shipbuilding practices and their relevance to contemporary maritime heritage conservation.(van Duivenvoorde, 2015)

PAPER 10

Assessing Sustainability in the Shipbuilding Supply Chain 4.0: A Systematic Review

This paper presents a systematic review of sustainability assessment methods in the shipbuilding supply chain 4.0. It examines the different approaches used to measure sustainability and their application in the shipbuilding industry. The study provides insights into the current state of sustainability in the shipbuilding sector and identifies areas for improvement.(Ramirez-Peña et al., 2020)

PAPER 11

Indian Shipbuilding in the Global Context: An empirical study on current state of industry and exploring scope for improvement

This paper presents an empirical study on the current state of the Indian shipbuilding industry and its potential for improvement in the global context. It analyses the industry's strengths, weaknesses, opportunities, and threats, and identifies strategies to enhance its competitiveness. The study provides insights for policymakers and stakeholders interested in the Indian shipbuilding industry.(John et al., n.d.)

PAPER 12

A Collaborative Design in Shipbuilding: Two Case Studies

The paper "A Collaborative Design in Shipbuilding: Two Case Studies" by Marina Z. Solesvik presents two case studies that explore how collaborative design processes can be used in shipbuilding. The first case study shows how a shipyard used a collaborative design process to design and build an advanced offshore vessel, while the second case study examines a collaborative design process used in the development of a new offshore service vessel. The paper discusses the benefits of collaborative design, including increased efficiency, reduced costs, and improved communication between stakeholders. It concludes that collaborative design processes have the potential to significantly improve shipbuilding projects and recommends further research in this area.(Solesvik, 2007)

PAPER 13

A Study on Global Shipbuilding Growth, Trend and Future Forecast

This paper presents a study on the global shipbuilding industry, analysing its growth and trends over the years, and making future forecasts. The research highlights key factors affecting the industry, such as economic conditions, technology, and regulations, and provides insights for stakeholders and policymakers.(Hossain & Zakaria, 2017)

2.2 LITERATURE GAP

While there has been a significant amount of research on ship building industry in India. The papers concentrate more on challenges faced by the Indian shipbuilding companies in India. Also, the different aspects of Indian ship building industry in India. This paper gives the idea of the ship building industry in the world such as total fleet statistics about the world fleet by country-wise. Also, provides the statistics about the Indian shipbuilding industry such as ships delivered and orders for the last few years. In the next steps the study gives the incites on problems faced by the Indian ship building industry and opportunities of Indian ship building industry.

CHAPTER 3

SHIP BUILDING INDUSTRY

3.1 SHIP BUILDING INDUSTRY AROUND THE GLOBE

The construction of ships, boats, and other nautical vessels is a part of the worldwide shipbuilding industry. 90% of all international trade is transported by ships, making it a crucial sector for the world economy and a key link in the global supply chain.

Countries like South Korea, Japan, China, Germany, and the United States are some of the leading participants in the shipbuilding sector.

China, Japan, and South Korea are now the top three countries in the world for shipbuilding. South Korea's dominance in the sector may be explained by its cutting-edge technical skills, effective manufacturing methods, and knowledgeable personnel.

China has emerged as a significant force in the shipbuilding sector in recent years, specialising in commercial vessels including tankers and cargo ships. China's shipbuilding sector has benefited from government investment and backing, as well as from lower costs than other countries.

With a concentration on high-tech, high-value ships like cruise ships and LNG carriers, Japan has long been a key participant in the shipbuilding sector. Germany is another significant competitor, with a focus on premium boats like luxury yachts and research vessels.

The U.S. shipbuilding business is largely concerned with producing military ships for the Coast Guard and Navy. Due to competition from foreign shipbuilders and limited government support, the U.S. industry has experienced difficulties recently.

Overall, the shipbuilding sector is quite competitive, with each nation contributing certain assets and skills to the mix. The sector is complicated and dynamic to manage since it is also strongly impacted by economic and geopolitical variables.

3.1.1 The annual growth of the commercial world fleet

The percentage increase in the number of ships or the total capacity of ships participating in commercial operations during a certain time, often calculated on an annual basis, is referred to as the annual growth of the commercial fleet in shipping.

This statistic is frequently used to determine whether the commercial shipping sector is growing or shrinking. A fleet size increase is indicated by a positive annual growth rate, whereas a fleet size drop is shown by a negative annual growth rate. Numerous variables, including the state of the economy, the volume of international commerce, technical

developments, legislative changes, and trends in shipping sector investment can affect the growth rate.

Understanding the overall state and dynamics of the shipping sector is made easier for stakeholders by tracking the annual increase of the commercial fleet. It offers perceptions into capacity utilisation, market trends, and prospective opportunities or difficulties. Shipping businesses, investors, analysts, and regulators may use this information to make well-informed choices on fleet expansion, resource allocation, and industry planning.

The below graph shows the annual growth rate of commercial fleet in the world:

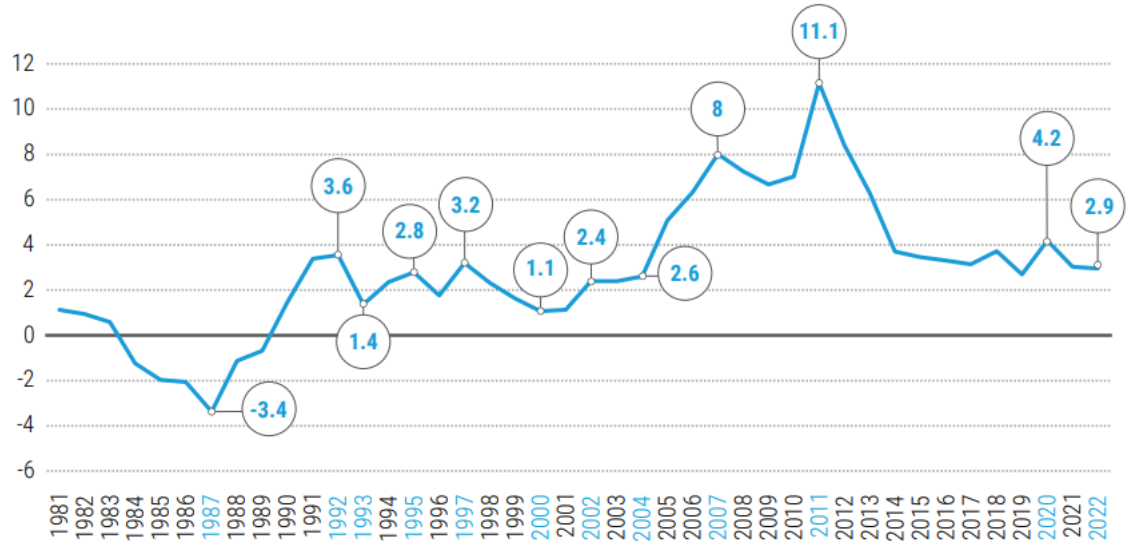

Figure 3.1: Annual growth rate of commercial fleet (% in DWT)

3.1.2 Ownership of world fleet

In the shipping sector, the ownership of the global fleet is diversified and dispersed across several nations and businesses.

Greek firms have historically controlled a sizable share of the world fleet, making Greece one of the top nations in terms of ship ownership. South Korea, Germany, China, Japan, and Norway are further important participants. These nations have a long history of maritime trade and have invested heavily in the shipping sector. Additionally, the shipping sector is now home to a large number of global firms and conglomerates from other nations. For their logistical requirements or as a component of their supply chain activities, these businesses frequently own or rent ships.

It's important to keep in mind that ship ownership might vary among various vessel types and market niches. Some businesses focus on certain industries, such container shipping, tanker operations, dry bulk ships, or speciality boats such offshore support boats or LNG carriers.

The ownership landscape is fluid and subject to change over time as a result of variables including mergers and acquisitions, prevailing economic conditions, alterations in regulatory requirements, and market trends. Therefore, in order to receive reliable and up-to-date information on the ownership of the global fleet, it is crucial to review the most recent industry publications or visit specialised databases.

	Country or Territory of Ownership	Container Ships	Bulk Carriers	Oil Tankers	Offshore vessels	Ferries & Passenger Ships	Gas Carriers	General Cargo Ships	Chemical Tankers	Other/NA	Total
1	China	45 104	56 487	14 948	11 457	5 219	4 630	9 026	3 857	4 098	154 827
2	Greece	30 051	55 797	35 608	228	2 280	22 432	297	932	533	148 157
3	Japan	34 010	51 558	10 105	5 145	3 264	18 420	3 670	5 270	13 036	144 477
4	United States	5 230	5 385	5 056	14 119	50 999	1 553	1 626	963	1 035	85 966
5	Germany	52 934	8 072	1 800	666	10 100	1 572	5 211	762	533	81 649
6	Singapore	21 249	19 553	12 942	4 274	12	4 844	1 393	5 406	809	70 481
7	United Kingdom	17 232	5 717	4 095	14 218	5 507	7 212	1 016	1 552	3 788	60 336
8	Hong Kong, China	29 066	15 475	7 160	124	2 075	1 619	1 305	266	1 613	58 704
9	Norway	4 297	5 573	5 436	20 251	3 423	8 224	1 397	2 488	5 235	56 325
10	Republic of Korea	13 801	11 854	6 994	403	524	6 029	701	1 587	4 035	45 929
11	Switzerland	25 913	917	535	2 896	10 546	196	227	168	5	41 404
12	Denmark	26 742	1 858	3 439	1 675	1 169	2 170	903	825	152	38 932
13	Taiwan Province of China	22 435	10 703	1 410	128	71	351	550	223	112	35 983

Table 3.1: Ownership of the world fleet by commercial value (million US$),2022 main vessel types

	Country or territory of ownership	Number of vessels			Deadweight tonnage				
		National flag	Foreign flag	Total	National flag	Foreign flag	Total	Foreign flag as a % of total	Total as a % of world
1	Greece	620	4 246	4 870	55 715 512	328 703 344	384 430 215	85.51	17.63
2	China	5 357	2 599	8 007	113 035 546	163 977 083	277 843 335	59.19	12.74
3	Japan	933	3 070	4 007	35 970 817	200 656 470	236 638 365	84.8	10.85
4	Singapore	1 371	1 400	2 799	67 869 137	68 312 248	136 243 709	50.16	6.25
5	Hong Kong, China	861	948	1 822	72 061 117	39 473 538	111 587 729	35.39	5.12
6	Republic of Korea	804	867	1 680	14 767 539	77 501 218	92 302 014	84	4.23
7	Germany	185	2 036	2 221	6 976 526	72 616 389	79 592 915	91.23	3.65
8	Bermuda	2	505	507	26 137	63 381 136	63 407 273	99.96	2.91
9	Norway including Svalbard and Jan Mayen Islands excluding Bouvet Island	982	1 002	1 987	18 980 244	40 945 002	59 931 039	68.33	2.75
10	United Kingdom of Great Britain and Northern Ireland including Channel Islands and Isle of Man	363	1 014	1 380	9 376 891	49 222 876	58 746 865	84	2.69

Table 3.2: Ownership of the world fleet by carrying capacity in dead-weight tons,2022

3.1.2 shipbuilding and new orders in the world market

The COVID-19 epidemic reduced shipbuilding in 2020. Deliveries in 2021 climbed by 5.2 percent to 60,779,648 GT, although they were still less than in the years 2014 to 2017 and in 2019. Three nations—China, the Republic of Korea, and Japan—continue to control the majority of the maritime ship supply; in 2022, they accounted for 94% of the market. China and the Republic of Korea had increases in shipbuilding over the last year of 15.5% and 8.3%, respectively, while Japan saw a 16.4% fall. Bulk carriers, oil tankers, container ships, and gas carriers made up the majority of the delivered tonnage in 2021 as they did in 2020. (table 2.8). Offshore boats had a rise in newbuilt tonnage of 142%, general cargo ships saw an increase of 74%, and gas carriers saw an increase of 54%. Bulk carriers had a 21% decrease, oil tankers an 11% decrease, and chemical tankers a 4% decrease, in contrast. Orders for container ships have increased by 129% in the last year to a new high. While the orderbook for tankers continued to decline in 2021, it shrank by 13.5%, the orderbook for liquefied gas carriers continued to rise, rising by 26%. The orderbook for bulkers saw a 4% increase, which was the first growth in three years (figure 2.9)).Due to deteriorating market conditions and higher newbuild pricing, the 2021 tanker and bulker order levels were the lowest in 25 years and almost an 18-year low, respectively. The majority of medium-sized ships (12,000–16,999 TEU) were contracted for in 2021, however throughout the previous year, both larger and smaller ships have been contracted. Due to anticipated fendering improvements in Asian intra-regional commerce, this is consistent with the spike in orders for container ships as well as for ships smaller than 3,000 TEU. According to Clarkson's, fleet growth will remain low overall in 2023, increasing by 1.7% in terms of dwt.

The availability of tonnage will be limited by the new environmental laws, which frequently call for slower speeds, despite fresh supply going online in 2023. Despite higher demand, owners are delaying the purchase of new ships and are instead maintaining their existing fleets, especially in the wet and dry sectors. This is because they are still unsure about the most affordable alternative fuels and the best strategies to reduce carbon emissions. Alternative fuel adoption is moving slowly. The transitional (fossil) fuel LNG has seen a dramatic increase in investment in recent years. The percentage of the fleet that was LNG-capable climbed from 2.0

to 2.4% in the year beginning August 2022, whilst the dead-weight tonnage on order decreased from 21 to 31%.

	China	Republic of Korea	Japan	Philippines	Rest of the world	Total	Percentage
Bulk Carriers	13 764	960	5 730	624	73	**21 151**	35%
Oil Tankers	4 791	6 376	2 064		358	**13 589**	22%
Container ships	4 170	4 675	1 954		131	**10 929**	18%
Gas Carriers	918	7 052	159		10	**8 138**	13%
Ferries and passenger ships	390	50	83	20	1 567	**2 110**	3%
General cargo ships	1 017	56	223		256	**1 552**	3%
Offshore vessels	641	402	9		317	**1 370**	2%
Chemical tankers	662	109	226		50	**1 047**	2%
Other	510	6	278		97	**892**	1%
Total	**26 863**	**19 687**	**10 726**	**643**	**2 859**	**60 780**	
Percentage	*44%*	*32%*	*18%*	*1%*	*5%*	***100%***	

Table 3.3: Deliveries of newbuilds by major vessel types country-wise 2021(000 tons)

However, the Ukraine conflict and the present energy crisis are driving up prices, casting doubt on LNG's contribution to the energy revolution, and posing issues with LNG infrastructure. Additionally, the prognosis seems unstable when accounting for pollution control rules. Despite the fact that LNG is the most popular alternative fuel, there are more and more orders for ships that can also run on methanol and ammonia.Ferries and 35 short-sea portions are both interested in electrification. Owners are switching to dual-fuel vessels to maintain their options. Nearly 40% of the orderbook as of March 2022 consisted of boats that may use alternative fuels.. 36 The Republic of Korea placed 70% of the orders for alternative fuel-capable ships in June 2022, followed by China (26%), Europe (58%), Japan (17%), and Europe (26%) for ships.37 Alternative fuels are currently not economically feasible since they are two to five times more expensive than traditional fuels. In response to the Clydebank Declaration, there have been a variety of public-private initiatives involving ports, carriers, and stakeholders in the marine supply chain to solve these concerns. By enhancing low-carbon energy supply infrastructure at ports, creating decarbonized fleets, and constructing "green corridors," the goal is to increase the supply of alternative fuels." (see chapter 7) These programmes could alter the competitive environment for low-carbon shipping. They will serve as proving grounds for alternative energy and technology, infrastructural collaborations, and laws and regulations across a variety of value chains. However, they have mostly included Northern Hemisphere actors, and as few ports are prepared for alternative energy, a two-tier port system may be in the works. This

emphasises the demand for financial mobilisation and teamwork to duplicate effective practises. More aid for poorer nations should be provided as part of the energy transition. With a project to make ports smart and sustainable and able to employ alternative energy and new technologies, UNCTAD is attempting to address these concerns for three African nations.

3.2 SHIPBUILDING INDUSTRY IN INDIA

The shipbuilding industry in India has a long history dating back to ancient times when ships were built for trade and naval purposes. Today, India's shipbuilding industry is a significant contributor to the country's economy, providing employment to thousands of people and generating substantial revenue.

India has a coastline of about 7,500 kilometres and is strategically located in the Indian Ocean, making it an ideal location for shipbuilding and maritime activities. The country has several major shipyards, including Cochin Shipyard Limited, Garden Reach Shipbuilders & Engineers, and Mazagon Dock Shipbuilders Limited.

The Indian government has taken several initiatives to promote the growth of the shipbuilding industry in the country. The 'Make in India' initiative, launched in 2014, aims to promote domestic manufacturing, including shipbuilding, and attract foreign investment in the sector. The government has also provided various incentives and subsidies to encourage private sector investment in the industry.

The shipbuilding industry in India has the potential to become a global leader in the field. However, it faces several challenges, including high operating costs, lack of modern technology, and intense competition from other shipbuilding nations like China, South Korea, and Japan. Nevertheless, with government support and private sector investment, the shipbuilding industry in India is expected to grow and contribute significantly to the country's economic development.

3.3 SHIPBUILDING COMPANIES IN INDIA

In India we can see private and public sector companies. There are 8 public sector shipbuilding companies in India. Here the small description about these companies is mentioned below.

3.3.1 PUBLIC SECTOR COMPANIES

Public sector companies in shipbuilding in India refer to government-owned entities that are involved in the design, construction, repair, and maintenance of ships, boats, and other marine vessels. These companies are owned by the Indian government and are established to promote the development of the shipbuilding industry in the country.

Some of the major public sector companies in shipbuilding in India include

1) Garden Reach Shipbuilders and Engineers Limited (GRSE).
2) Mazagon Dock Shipbuilders Limited (MDL)
3) Hindustan Shipyard Limited (HSL)
4) Cochin Shipyard Limited (CSL)
5) Alcock Ashdown & Co. Ltd.
6) Goa Shipyard Ltd.
7) Hooghly Dock & Port Engineers Ltd.
8) Shalimar Works Ltd.

1) Garden Reach Shipbuilders and Engineers Limited (GRSE)

Garden Reach Shipbuilders and Engineers Limited (GRSE) is a public sector shipbuilding company located in Kolkata, India. Established in 1884, GRSE has a rich history of building high-quality ships for both military and commercial use.

The company specializes in the design and construction of warships and auxiliary vessels for the Indian Navy and Coast Guard, as well as commercial vessels such as bulk carriers, tankers, and passenger ships. GRSE has an extensive portfolio of shipbuilding projects, including frigates, corvettes, patrol vessels, and landing craft.

GRSE has modern shipbuilding facilities and infrastructure that enable it to build state-of-the-art vessels using advanced technologies and processes. The company has a highly skilled and experienced workforce that includes engineers, designers, and technicians who are capable of delivering complex shipbuilding projects on time and within budget.

In addition to shipbuilding, GRSE also provides a range of after-sales services, including repair, maintenance, and refit of ships. The company is committed to achieving high levels of customer satisfaction and has a reputation for delivering quality products and services.

Overall, GRSE is an important player in the Indian shipbuilding industry, contributing to the country's economic growth and national security through the construction of advanced naval vessels and commercial ships.

2) Mazagon Dock Shipbuilders Limited (MDL)

Mazagon Dock Shipbuilders Limited (MDL) is a public sector company located in Mumbai, India. It was established in 1934 and is one of India's leading shipyards, specializing in the construction of submarines and warships for the Indian Navy.

MDL has a rich history of building high-quality naval vessels, including the INS Khanderi, India's second Scorpene-class submarine, and the INS Kalvari, India's first Scorpene-class submarine. The shipyard also played a crucial role in the construction of India's first aircraft carrier, INS Vikrant.

In addition to building submarines and warships, MDL also undertakes repairs and maintenance of naval vessels and commercial ships. The company has a highly skilled workforce and a modern infrastructure that enables it to undertake complex shipbuilding projects.

MDL is committed to promoting indigenization and self-reliance in the shipbuilding industry and works closely with the Indian Navy and other government agencies to develop new technologies and capabilities. The company has won several awards for its excellence in shipbuilding, including the Raksha Mantri's Award for Excellence in 2019.

3) Hindustan Shipyard Limited (HSL)

Hindustan Shipyard Limited (HSL) is a public sector shipyard located in Visakhapatnam, Andhra Pradesh, India. Established in 1941, HSL has a long history of shipbuilding and has been involved in the construction of a variety of vessels, including warships, submarines, and merchant ships.

HSL is primarily focused on the construction of naval vessels and has a reputation for building high-quality ships for the Indian Navy. The shipyard has been involved in the construction of several prestigious naval projects, including India's first missile destroyer, INS Rajput, and India's first indigenously built nuclear submarine, INS Arihant.

Apart from shipbuilding, HSL also provides repair and maintenance services for ships, including routine maintenance, overhaul, and refurbishment. The shipyard has modern facilities and infrastructure to undertake repairs and maintenance of a wide range of vessels.

In recent years, HSL has undertaken several initiatives to modernize its operations and increase its competitiveness in the global shipbuilding industry. The shipyard has invested in new technologies and processes to improve efficiency and productivity and has also established partnerships with leading international shipyards to enhance its capabilities.

Overall, HSL is an important player in the Indian shipbuilding industry and a crucial contributor to India's maritime sector. With its experienced workforce, modern facilities, and commitment to innovation, HSL is well-positioned to continue its growth and development in the years ahead.

4) Cochin Shipyard Limited (CSL)

Cochin Shipyard Limited (CSL) is a public sector shipyard located in Kochi, Kerala, India. Established in 1972, CSL has become one of the leading shipbuilding and ship repair yards in India, with a focus on building high-quality, technologically advanced vessels.

CSL is capable of constructing a wide range of vessels, including bulk carriers, tankers, offshore vessels, passenger ships, and fast patrol vessels. The shipyard has built several notable vessels, including India's first indigenous aircraft carrier, INS Vikrant, and the country's first indigenous marine ambulance boat, PRATHEEKSHA.

In addition to shipbuilding, CSL also provides repair and maintenance services for ships, including dry docking and ship conversion. The shipyard has facilities to accommodate vessels up to 125,000 DWT and has dry docks that can handle vessels up to 255 meters in length and 60 meters in width.

CSL has a highly skilled workforce and a strong focus on research and development, which has enabled it to deliver innovative solutions and technologies to its customers. The shipyard is committed to sustainability and has implemented several measures to reduce its environmental footprint, including the use of renewable energy sources and the adoption of green technologies.

Overall, Cochin Shipyard Limited has played a significant role in the development of India's shipbuilding industry and is a key contributor to the country's economy and national security.

5) Alcock Ashdown & Co. Ltd.

Alcock Ashdown & Co. Ltd. was a British shipbuilding company that was founded in 1859 in Rangoon, Burma (now Myanmar). The company later moved its operations to India and became one of the leading shipbuilders in the country.

During its heyday in the early 20th century, Alcock Ashdown & Co. Ltd. built a range of vessels, including cargo ships, passenger ships, tugs, and dredgers. The company also played a significant role in the development of the Indian Navy, building several warships and support vessels for the Indian government.

In addition to shipbuilding, Alcock Ashdown & Co. Ltd. also had interests in other industries, including coal mining, jute manufacturing, and engineering. The company's success in these industries helped it become one of the largest employers in the region.

However, in the 1980s, the company began to face financial difficulties and was eventually taken over by the Indian government. Today, the shipyard is owned and operated by Garden Reach Shipbuilders and Engineers Limited (GRSE), which continues to build a range of vessels for both commercial and naval use.

6) Goa Shipyard Ltd.

Goa Shipyard Limited (GSL) is a public sector company in India that specializes in the design, construction, and repair of ships, boats, and other maritime vessels. Established in 1957, GSL is located on the West Coast of India, in the state of Goa.

The company has a modern shipyard facility that includes state-of-the-art equipment and infrastructure to support its shipbuilding activities. GSL is capable of building a wide range of vessels, including patrol vessels, offshore patrol vessels, fast attack craft, and landing craft utility vessels.

In addition to shipbuilding, GSL is also involved in ship repair and maintenance services. The company has a dedicated team of engineers and technicians who provide a range of repair and maintenance services to both commercial and defence vessels.

GSL has a strong focus on quality and safety, and has been accredited with several quality and safety certifications. The company has also received numerous awards and recognitions for its contribution to the Indian shipbuilding industry.

Overall, Goa Shipyard Limited is a key player in the Indian shipbuilding industry, with a reputation for delivering high-quality vessels and services. The company has been involved in many prestigious projects, including the construction of patrol vessels for the Indian Coast Guard and the construction of landing craft utility vessels for the Indian Navy.

7) Hooghly Dock & Port Engineers Ltd.

Hooghly Dock & Port Engineers Ltd. (HDPEL) is a public sector shipbuilding and engineering company in India, headquartered in Kolkata, West Bengal. The company was established in 1937 and has since been involved in the design, construction, repair, and maintenance of various types of marine vessels, including tugs, dredgers, barges, and floating cranes.

HDPEL's shipyard is located on the bank of the Hooghly River and covers an area of 50 acres, with a waterfront of 800 meters. The shipyard has a dry dock that can accommodate vessels up to 12,000 DWT and a slipway that can handle vessels up to 3,000 DWT.

The company has a skilled workforce of over 700 employees, including engineers, designers, and technicians, who are trained to deliver high-quality marine engineering solutions to customers. HDPEL has a strong focus on technology and innovation and has been continuously modernizing its facilities and equipment to keep pace with changing market demands.

In addition to shipbuilding, HDPEL is also involved in the manufacturing of industrial and engineering products, including cranes, hydraulic cylinders, and steel structures. The company has established itself as a leading provider of marine engineering services in India, with a reputation for quality, reliability, and timely delivery.

8) Shalimar Works Ltd.

Shalimar Works Ltd. is a company based in Kolkata, India, that is primarily engaged in the business of shipbuilding, ship repair, and fabrication. The company was established in 1978 and has since grown to become a leading player in the Indian shipbuilding industry.

Shalimar Works specializes in the construction of small to medium-sized ships, such as coastal tankers, tugs, barges, and fishing vessels. The company also offers repair and maintenance services for a wide range of vessels.

In addition to its shipbuilding and repair activities, Shalimar Works is also involved in the fabrication of structural steel and provides engineering services for industrial projects. The company has a modern shipyard facility equipped with state-of-the-art machinery and tools, as well as a team of skilled engineers and technicians.

With a focus on quality and customer satisfaction, Shalimar Works has built a strong reputation in the Indian shipbuilding industry. The company has delivered numerous vessels to both domestic and international clients and has established long-term partnerships with many of them.

Overall, Shalimar Works Ltd. is a dynamic and innovative company that is committed to the growth and development of the Indian shipbuilding industry.

3.3.2 PRIVATE SHIPBUILDING COMPANIES IN INDIA

There are several private shipbuilding companies in India that are involved in the construction, repair, and maintenance of ships and marine vessels. Some of the major private shipbuilding companies in India include:

1. ABG Shipyard Ltd.: Established in 1985, ABG Shipyard is a leading private shipbuilding company in India. The company specializes in the construction of vessels such as offshore support vessels, anchor handling tug supply vessels, and bulk carriers.

2. Bharati Shipyard Ltd.: Bharati Shipyard is another prominent private shipbuilding company in India that specializes in the construction of commercial vessels such as bulk carriers, tankers, and dredgers. The company also provides repair and maintenance services for a wide range of vessels.

3. Pipavav Defence and Offshore Engineering Company Ltd.: Pipavav Defence is a private shipbuilding company that specializes in the construction of naval vessels, including frigates, corvettes, and patrol vessels. The company also offers repair and maintenance services for naval vessels.

4. L&T Shipbuilding Ltd.: L&T Shipbuilding is a subsidiary of Larsen & Toubro, one of India's largest engineering and construction companies. The company specializes in the construction of high-value, complex vessels such as LNG carriers, offshore support vessels, and warships.

5. Cochin Shipyard Ltd.: Although Cochin Shipyard is a public sector company, it has a significant private sector presence as well. The company offers shipbuilding, repair, and maintenance services to a wide range of clients, including private sector companies in India and abroad.

These private shipbuilding companies in India play a vital role in the development of the country's maritime sector and contribute significantly to the country's economic growth.

CHAPTER 4

SHIP BUILDING IN INDIA DATA ANLYSIS

4.1 SHIP BUILDING ORDERS

India had a growing shipbuilding industry, with several shipbuilding orders being placed. Here the data is collected for the last 5 years for private and public shipbuilding companies in India.

4.1.1 SHIP BUILDING ORDERS BY NUMBER OF SHIPS

Name of the companies	2017-18	2018-19	2019-20	2020-21	2021-22
Alcock Ashdown & Co. Ltd.	5	5	0	0	0
Cochin Shipyard Ltd	9	47	62	50	49
Garden Reach Ship- Builders & Engineers	14	14	18	17	23
Goa Shipyard Ltd.	7	9	12	25	34
Hindustan Shipyard Ltd.	14	16	10	9	6
Hooghly Dock & Port Engineers Ltd.	0	0	0	0	0
Mazagaon Dock Shipbuilders Ltd.	14	14	14	14	9
Shalimar Works Ltd.	6	6	12	10	9
TOTAL (public companies)	**69**	**111**	**128**	**125**	**130**
private companies	162	77	121	155	208
grand total	**231**	**188**	**249**	**280**	**338**

Table 4.1: Ship building orders by number of ships

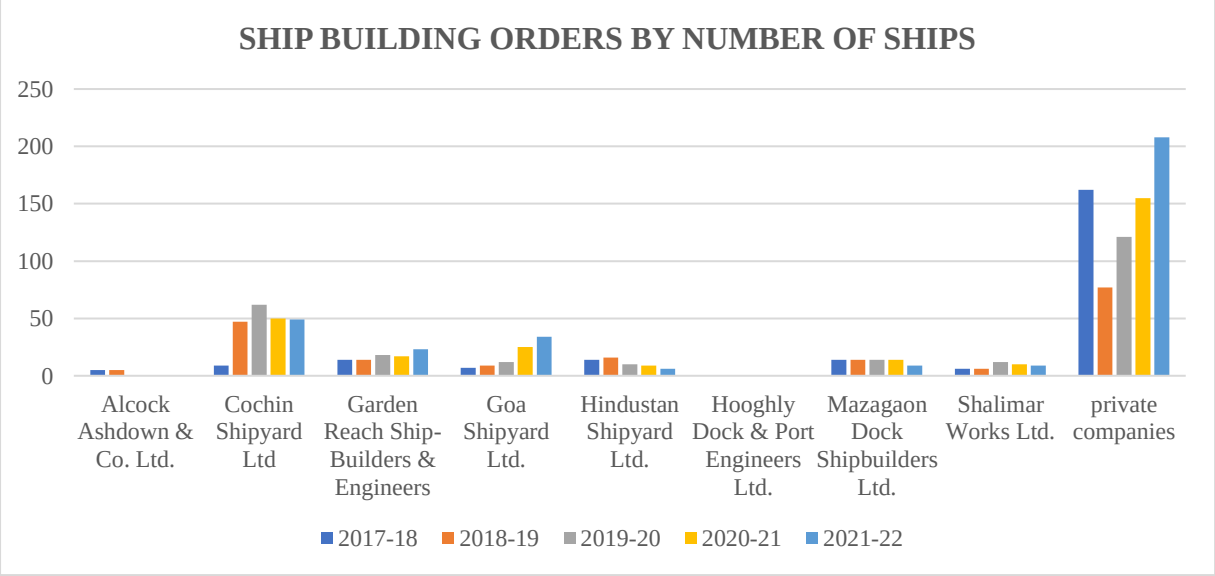

Figure 4.1: Ship building orders by number of ships

The table provided shows the number of shipbuilding orders received by various companies in India from the years 2017-18 to 2021-22.

1. Public Companies:

- Cochin Shipyard Ltd: Cochin Shipyard has consistently received a significant number of shipbuilding orders each year, ranging from 9 in 2017-18 to 62 in 2019-20. Although the number decreased slightly in the following years, it remained relatively high with 49 orders in 2021-22.

- Garden Reach Ship-Builders & Engineers: This company has shown a steady increase in shipbuilding orders over the years, starting with 14 orders in 2017-18 and reaching a peak of 23 orders in 2021-22.

- Goa Shipyard Ltd: The number of orders received by Goa Shipyard has been fluctuating, but there has been an overall upward trend, with a significant increase from 9 orders in 2018-19 to 34 orders in 2021-22.

- Hindustan Shipyard Ltd: Hindustan Shipyard has experienced some fluctuations in the number of orders, but there is a general downward trend from 14 orders in 2017-18 to 6 orders in 2021-22.

- Mazagaon Dock Shipbuilders Ltd: Mazagaon Dock Shipbuilders has shown relatively consistent shipbuilding orders over the years, with a slight decrease from 14 orders in 2017-18 to 9 orders in 2021-22.

- Other Public Companies: Alcock Ashdown & Co. Ltd., Hooghly Dock & Port Engineers Ltd., and Shalimar Works Ltd. did not receive any shipbuilding orders during the specified period.

2. Private Companies:

- Private shipbuilding companies have shown fluctuations in the number of shipbuilding orders, but there is an overall increasing trend. The number of orders increased from 77 in 2018-19 to 208 in 2021-22.

3. Grand Total:

- The total number of shipbuilding orders, including both public and private companies, has shown a significant increase over the years. It increased from 231 orders in 2017-18 to 338 orders in 2021-22.

Overall, the table demonstrates the varying levels of shipbuilding orders received by different companies in India. It highlights the dominance of Cochin Shipyard Ltd. in terms of consistently receiving a high number of orders, along with an increasing trend in shipbuilding orders from private companies.

4.1.2 SHIP BUILDING ORDERS BY DEAD WEIGHT TONNAGE

(in "000" DWT)

Name of the companies	2018-19	2019-20	2020-21	2021-22
Alcock Ashdown & Co. Ltd.	1.11	0	0	0
Cochin Shipyard Ltd	49.27	49.4	40.14	86.83
Garden Reach Ship- Builders & Engineers	8.4	8.72	8.88	8.91
Goa Shipyard Ltd.	5.74	4.38	4.54	5.31
Hindustan Shipyard Ltd.	58.32	4.8	1.45	1.32
Hooghly Dock & Port Engineers Ltd.	0	0	0	0
Mazagaon Dock Shipbuilders Ltd.	0	0	0	0
Shalimar Works Ltd.	0.83	2	1.4	1.4
TOTAL (public companies)	**123.67**	**69.3**	**56.41**	**103.77**
private companies	48.06	49.01	222.66	105.27
grand total	**171.73**	**118.31**	**279.07**	**209.04**

Table 4.2: Ship building orders by dead weight tonnage

The table provided shows the value of shipbuilding orders received by various companies in India from the years 2018-19 to 2021-22.

1. Public Companies:

- Cochin Shipyard Ltd: Cochin Shipyard has consistently received a significant value of shipbuilding orders each year. The value increased from 49.27 in 2018-19 to 86.83 in 2021-22, with a slight dip in 2020-21. Cochin Shipyard remains a major player in terms of the value of shipbuilding orders.

- Garden Reach Ship-Builders & Engineers: The value of shipbuilding orders for Garden Reach Ship-Builders & Engineers has remained relatively stable over the years, ranging from 8.4 to 8.91.

(in "000" DWT)

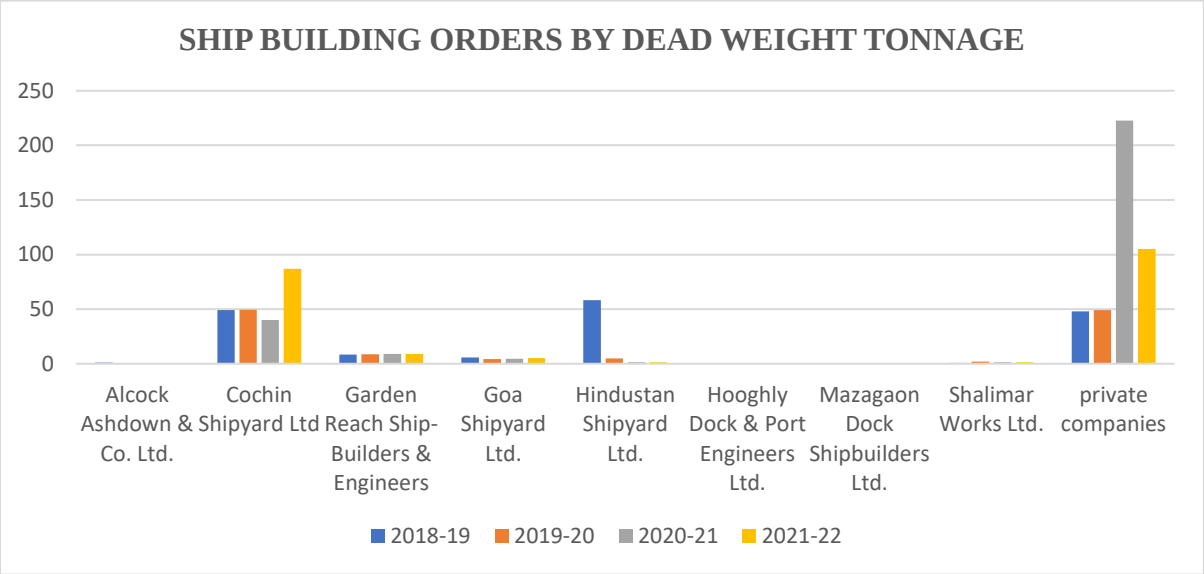

Figure 4.2: Ship building orders by dead weight tonnage

- Goa Shipyard Ltd: The value of shipbuilding orders for Goa Shipyard has fluctuated, but there is no significant increase or decrease during the specified period.

- Hindustan Shipyard Ltd: Hindustan Shipyard has experienced fluctuations in the value of shipbuilding orders. There was a significant decrease from 58.32 in 2018-19 to 1.32 in 2021-22.

- Other Public Companies: Alcock Ashdown & Co. Ltd., Hooghly Dock & Port Engineers Ltd., and Mazagaon Dock Shipbuilders Ltd. did not have any value of shipbuilding orders during the specified period.

2. Private Companies:

- Private shipbuilding companies have shown fluctuations in the value of shipbuilding orders. The value increased from 48.06 in 2018-19 to 222.66 in 2020-21, but there was a decline to 105.27 in 2021-22.

3. Grand Total:

- The total value of shipbuilding orders, including both public and private companies, has shown variations over the years. It increased from 171.73 in 2018-19 to 279.07 in 2020-21, but there was a decrease to 209.04 in 2021-22.

Overall, the data indicates that the value of shipbuilding orders in India has shown fluctuations, with Cochin Shipyard Ltd. being a key player in terms of consistently receiving high-value orders. Private companies also play a significant role in the shipbuilding industry, although the value of their orders has shown more volatility. It's worth noting that the specific factors influencing the values can vary, such as the size and complexity of the vessels being built and the contractual terms agreed upon.

4.2 SHIPS DELIVERED

India has seen the delivery of various types of ships as its shipbuilding industry continues to grow.

4.2.1 NUMBER OF SHIPS DELIVERED

name of the companies	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Alcock Ashdown & Co. Ltd.	0	0	0	0	0	0	0
Cochin Shipyard Ltd	6	5	2	3	16	13	12
Garden Reach Ship-Builders & Engineers	1	4	4	4	4	3	0
Goa Shipyard Ltd.	15	9	7	3	1	2	3
Hindustan Shipyard Ltd.	3	3	0	6	5	1	4
Hooghly Dock & Port Engineers Ltd.	4	0	0	0	0	0	0
Mazagaon Dock Shipbuilders Ltd.	2	1	1		1	1	2
Shalimar Works Ltd.	1	1	1	1	0	2	1

TOTAL (public companies)	**32**	**23**	**15**	**17**	**27**	**22**	**22**
private companies	23	30	49	24	51	47	91
grand total	**55**	**53**	**64**	**41**	**78**	**69**	**113**

Table 4.3: Number of ships delivered

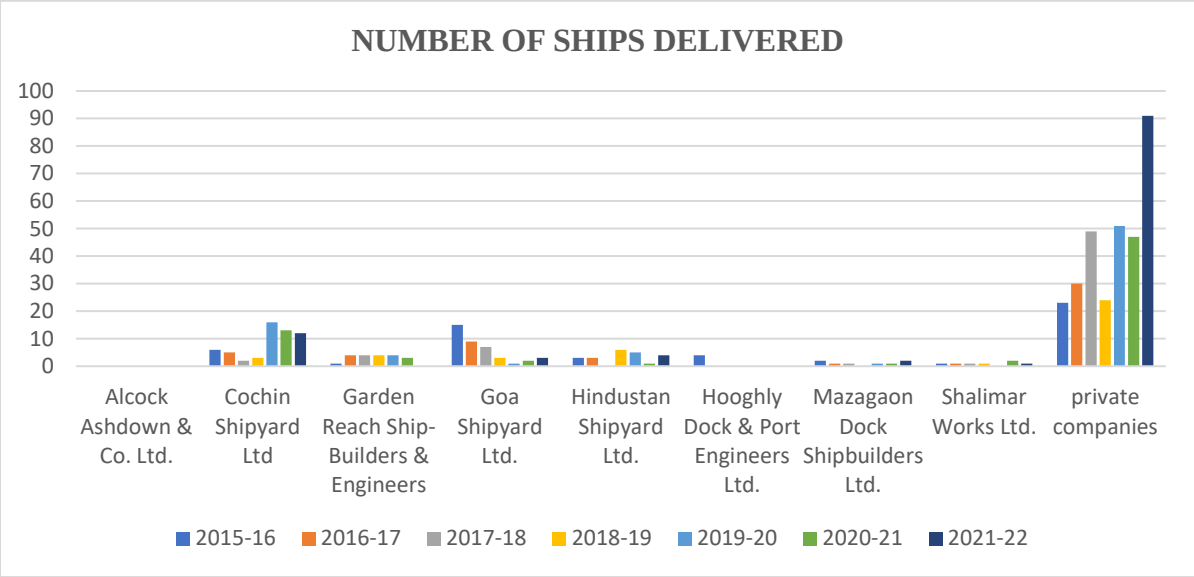

figure 4.3: Number of ships delivered

The table provided shows the number of ships delivered by various companies in India from the years 2015-16 to 2021-22.

1. Public Companies:

- Cochin Shipyard Ltd: Cochin Shipyard has consistently delivered ships over the years, with varying numbers. The number of ships delivered ranged from 2 in 2017-18 to a peak of 16 in 2019-20. In 2021-22, the company delivered 12 ships.

- Garden Reach Ship-Builders & Engineers: Garden Reach Ship-Builders has shown a relatively consistent delivery of ships, ranging from 3 to 4 ships per year, with a decrease to 0 ships in 2021-22.

- Goa Shipyard Ltd: The number of ships delivered by Goa Shipyard has varied over the years, ranging from 1 to 15. In 2021-22, the company delivered 3 ships.

- Hindustan Shipyard Ltd: Hindustan Shipyard has shown fluctuations in the number of ships delivered. The number ranged from 0 to 6 ships per year, with an increase to 4 ships in 2021-22.

- Other Public Companies: Alcock Ashdown & Co. Ltd., Hooghly Dock & Port Engineers Ltd., and Mazagaon Dock Shipbuilders Ltd. did not deliver any ships during the specified period.

2. Private Companies:

- Private shipbuilding companies have delivered a significant number of ships, with varying figures each year. The number of ships delivered ranged from 23 to 91 in 2021-22.

3. Grand Total:

- The total number of ships delivered, including both public and private companies, has shown variations over the years. It increased from 55 in 2015-16 to 113 in 2021-22, with fluctuations in between.

Overall, the data indicates that both public and private shipbuilding companies in India have been involved in delivering ships. Cochin Shipyard Ltd. has consistently delivered a significant number of ships, while other companies have shown varying levels of delivery. Private companies have also made a substantial contribution to the total number of ships delivered.

4.2.2 SHIPS DELIVERED IN DWT

(in "000" DWT)

Name of the company	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Alcock Ashdown & Co. Ltd.	0	0	0	0	0	0	0
Cochin Shipyard Ltd	1.5	45.54	0.12	0.15	1.03	2.29	36.47
Garden Reach Ship- Builders & Engineers	45	0.41	1.02	0.71	0.85	0.33	0
Goa Shipyard Ltd.	1.27	0.99	3.82	2	0.46	0.92	0.94
Hindustan Shipyard Ltd.	0.46	0.46		0.4	0.2	3.35	0.51

Hooghly Dock & Port Engineers Ltd.	0.24	0	0	0	0	0	0
Mazagaon Dock Shipbuilders Ltd.	0	0	0	0	0	0	0
Shalimar Works Ltd.	0.04	0.05	0.05	0.05	0	0.6	0.01
TOTAL (public companies)	**48.51**	**47.45**	**5.01**	**3.31**	**2.54**	**7.49**	**37.93**
private companies	94.53	80.54	105.35	21.46	28.72	22.79	71.75
grand total	**143.04**	**127.99**	**110.36**	**24.77**	**31.26**	**30.28**	**109.68**

Table 4.4: Ships Delivered in Dwt

(in “000” DWT)

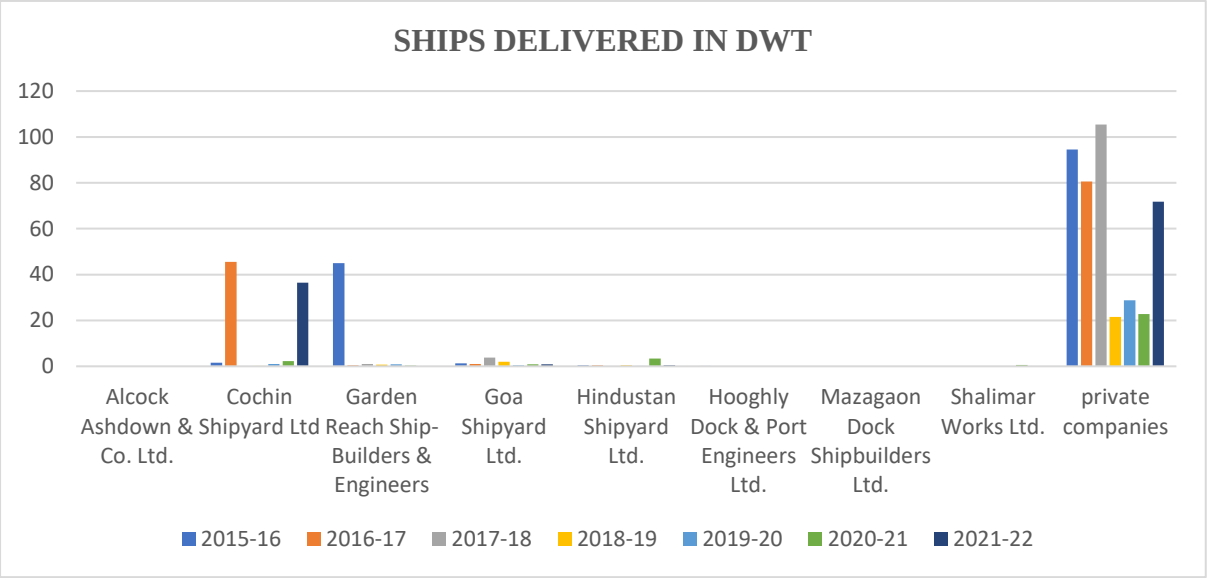

Figure 4.4: Ships Delivered in Dwt

The table provided shows the value of ships delivered by various companies in India from the years 2015-16 to 2021-22.

1. Public Companies:

- Cochin Shipyard Ltd: Cochin Shipyard has shown fluctuations in the value of ships delivered over the years. The value ranged from 0.12 in 2017-18 to a significant increase of 36.47 in 2021-22, with varying figures in between.

- Garden Reach Ship-Builders & Engineers: The value of ships delivered by Garden Reach Ship-Builders has been relatively low, ranging from 0.33 to 1.02, with a decrease to 0 in 2021-22.

- Goa Shipyard Ltd: The value of ships delivered by Goa Shipyard has varied over the years, ranging from 0.46 to 3.82. In 2021-22, the value was 0.94.

- Hindustan Shipyard Ltd: Hindustan Shipyard has shown fluctuations in the value of ships delivered, with a significant increase to 3.35 in 2020-21 and a decrease to 0.51 in 2021-22.

- Other Public Companies: Alcock Ashdown & Co. Ltd., Hooghly Dock & Port Engineers Ltd., and Mazagaon Dock Shipbuilders Ltd. did not deliver any ships during the specified period.

2. Private Companies:

- Private shipbuilding companies have delivered a higher value of ships compared to public companies. The value ranged from 21.46 to 105.35 in 2019-20, with fluctuations in between. In 2021-22, the value of ships delivered by private companies was 71.75.

3. Grand Total:

- The total value of ships delivered, including both public and private companies, has shown variations over the years. It increased from 143.04 in 2015-16 to 109.68 in 2021-22, with fluctuations in between.

Overall, the data indicates that private shipbuilding companies in India have contributed significantly to the value of ships delivered. Cochin Shipyard Ltd. has shown fluctuations in the value of ships delivered, while other public companies have delivered fewer ships with lower values.

4.3 SHIP BUILDING CAPACITY PUBLIC COMPANIES - BY COMPANY-WISE

Shipbuilding capacity refers to the capability of a shipyard or a country's shipbuilding industry to construct and deliver ships within a given timeframe. It represents the maximum number and size of ships that can be built simultaneously or consecutively by a shipyard or industry.

Shipbuilding capacity is influenced by several factors:

1. Infrastructure: Shipyards need adequate facilities and infrastructure to construct ships, including dry docks, slipways, fabrication shops, outfitting facilities, and storage areas. The availability and condition of these facilities determine the shipyard's capacity to handle multiple projects simultaneously.

2. Technical Expertise: Shipbuilding requires specialized knowledge and skills in naval architecture, marine engineering, welding, outfitting, and other related fields. Shipyards need a skilled workforce with the necessary expertise to carry out ship construction activities efficiently.

3. Production Processes: Efficient production processes and project management play a crucial role in determining shipbuilding capacity. Shipyards employ various techniques such as modular construction, pre-outfitting, and concurrent engineering to streamline production and reduce construction time.

4. Financial Resources: Adequate financial resources are essential to invest in infrastructure, procure equipment, and sustain operations. Shipyards need access to funds for research and development, workforce training, and technological upgrades to enhance their capacity.

5. Orderbook: The number and size of shipbuilding orders in a shipyard's orderbook influence its capacity. A higher orderbook indicates a greater workload and may require the shipyard to expand its capacity to meet the demand.

6. Industry Collaboration: Collaboration with suppliers, subcontractors, and other stakeholders in the shipbuilding industry is vital to enhance capacity. Effective supply chain management and partnerships can ensure timely delivery of materials, components, and equipment, reducing construction lead times.

Countries with a robust shipbuilding industry often have multiple shipyards that collectively contribute to the nation's shipbuilding capacity. These countries typically have established shipbuilding clusters or zones that promote collaboration and sharing of resources among shipyards.

Shipbuilding capacity is a critical factor for countries aiming to strengthen their maritime industries, support naval defence capabilities, promote trade and commerce, and contribute to the global shipbuilding market. Continual investment in infrastructure, technology, and skilled labour is essential to increase shipbuilding capacity and maintain competitiveness in the global shipbuilding industry.

(in “000” DWT)

Name of the company	2017-18	2018-19	2019-20	2020-21	2021-22
Alcock Ashdown & Co. Ltd.	15	15	0	0	0
Cochin Shipyard Ltd	110	110	110	110	110
Garden Reach Ship-Builders & Engineers	0	0	0	0	0
Goa Shipyard Ltd.	4.5	4.5	4.5	4.5	4.5
Hindustan Shipyard Ltd.	80	80	80	80	80
Hooghly Dock & Port Engineers Ltd.	3	3	3	0	0
Mazagaon Dock Shipbuilders Ltd.	40	40	40	0	0
Shalimar Works Ltd.	0.5	0.5	1.2	1.2	1.2

Table 4.5: Ship building capacity public companies - by company-wise

The table provided shows the shipbuilding capacity of public companies in terms of thousand deadweight tonnage (1000DWT) for the years 2017-18 to 2021-22.

1. Alcock Ashdown & Co. Ltd.: The shipbuilding capacity of Alcock Ashdown & Co. Ltd. remained constant at 15,000 DWT from 2017-18 to 2018-19. However, there was no reported shipbuilding capacity for the company from 2019-20 to 2021-22.

2. Cochin Shipyard Ltd: Cochin Shipyard Ltd maintained a consistent shipbuilding capacity of 110,000 DWT throughout the specified period.

3. Garden Reach Ship-Builders & Engineers: The table shows no reported shipbuilding capacity for Garden Reach Ship-Builders & Engineers from 2017-18 to 2021-22.

4. Goa Shipyard Ltd: Goa Shipyard Ltd had a consistent shipbuilding capacity of 4,500 DWT from 2017-18 to 2021-22.

(in “000” DWT)

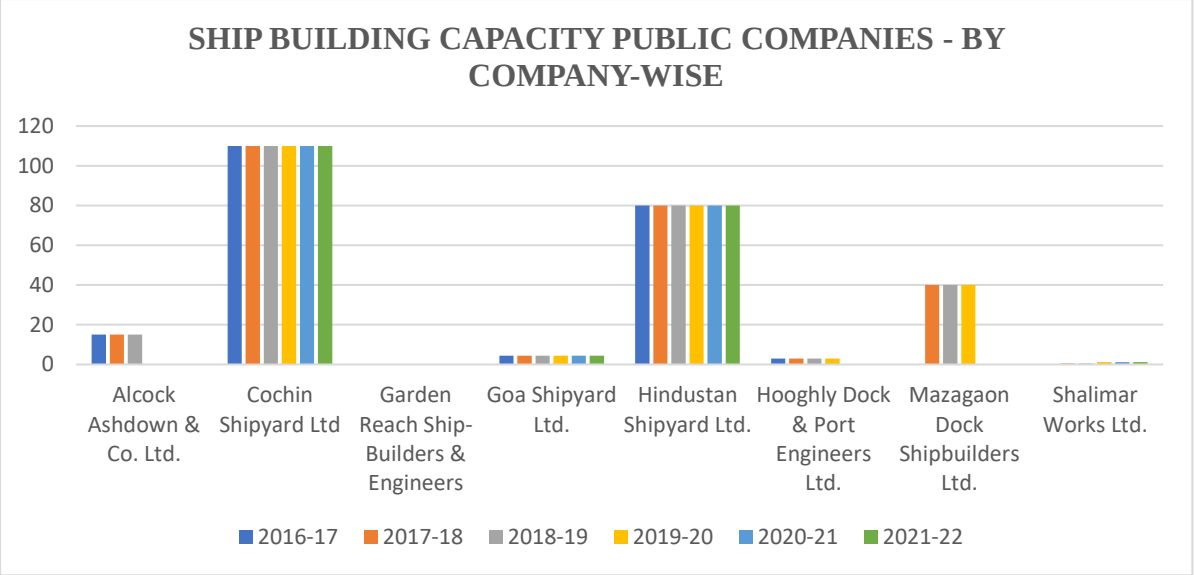

Figure 4.5: Ship building capacity public companies - by company-wise

5. Hindustan Shipyard Ltd: Hindustan Shipyard Ltd maintained a steady shipbuilding capacity of 80,000 DWT throughout the specified period.

6. Hooghly Dock & Port Engineers Ltd: Hooghly Dock & Port Engineers Ltd had a shipbuilding capacity of 3,000 DWT from 2017-18 to 2019-20. However, there was no reported shipbuilding capacity for the company in 2020-21 and 2021-22.

7. Mazagaon Dock Shipbuilders Ltd: Mazagaon Dock Shipbuilders Ltd had a shipbuilding capacity of 40,000 DWT from 2017-18 to 2019-20. However, there was no reported shipbuilding capacity for the company in 2020-21 and 2021-22.

8. Shalimar Works Ltd: Shalimar Works Ltd had a shipbuilding capacity that increased from 500 DWT in 2017-18 and 2018-19 to 1,200 DWT from 2019-20 to 2021-22.

From the analysis, it can be observed that Cochin Shipyard Ltd had the highest consistent shipbuilding capacity of 110,000 DWT among the public companies throughout the specified period. Other companies either had lower capacities, remained constant, or did not report shipbuilding capacity for certain years.

4.4 PROBLEMS IN INDIAN SHIPBUILDING INDUSTRY

The Indian shipbuilding industry has faced several challenges in recent years. Here are some of the key problems:

4.4.1 LACK OF INFRASTRUCTURE

The shipbuilding industry in India has suffered from a lack of modern infrastructure, including shipyards and docking facilities. The existing facilities often lack advanced technologies, leading to inefficiencies and higher costs.

4.4.2 SKILL SHORTAGE

There is a shortage of skilled manpower in the shipbuilding industry. Shipbuilding requires specialized knowledge and expertise in areas such as naval architecture, marine engineering, and welding. The lack of skilled workers has hindered the industry's growth and competitiveness.

4.4.3 COST COMPETITIVENESS

Indian shipyards have struggled to compete with international players in terms of cost. Factors such as high capital costs, taxes, and bureaucratic processes have led to higher production costs, making Indian shipyards less attractive to international buyers.

4.4.4 DELAYED PROJECTS

Delayed project execution has been a persistent issue in the Indian shipbuilding industry. Factors such as lack of coordination among stakeholders, delays in regulatory approvals, and insufficient project planning have contributed to project delays, resulting in cost overruns and loss of customer confidence.

4.4.5 FINANCING CHALLENGES

Access to financing remains a challenge for Indian shipyards, particularly for large-scale projects. Lack of availability of long-term funds, high interest rates, and stringent lending criteria have restricted the industry's growth potential and the ability to undertake significant projects.

4.4.6 INADEQUATE RESEARCH AND DEVELOPMENT

Limited investment in research and development (R&D) activities has hampered innovation in the shipbuilding sector. The lack of R&D initiatives has prevented the industry from adopting advanced technologies and improving efficiency in ship design, construction, and operations.

4.4.7 REGULATORY FRAMEWORK

The shipbuilding industry in India has been subject to complex and lengthy regulatory procedures. Obtaining clearances and complying with various regulations can be time-consuming and burdensome, affecting the ease of doing business in the sector.

4.4.8 COMPETITION FROM FOREIGN SHIPBUILDERS

Indian shipbuilders face stiff competition from established foreign players, particularly from countries like South Korea, China, and Japan. These countries have significant technological capabilities, economies of scale, and established supply chains, giving them a competitive advantage over Indian shipyards.

Addressing these challenges requires a comprehensive approach involving infrastructure development, skill enhancement programs, policy reforms, financial support, and increased investment in research and development. By tackling these issues, the Indian shipbuilding industry can become more competitive, attract more orders, and contribute significantly to the country's economic growth.

4.5 OPPORTUNITIES FOR INDIAN SHIPBUILDING INDUSTRY

The Indian shipbuilding industry, despite its challenges, also presents several opportunities for growth and development. With the right strategies and investments, India can leverage these opportunities to enhance its position in the global shipbuilding market. Some of the key opportunities for the Indian shipbuilding industry are:

4.5.1 DOMESTIC DEMAND

India has a vast coastline of over 7,500 kilometres and a growing maritime sector, including shipping, offshore oil and gas exploration, and coastal security. The domestic demand for ships, including cargo vessels, offshore support vessels, and naval ships, presents a significant opportunity for the Indian shipbuilding industry. By focusing on meeting domestic demand, Indian shipbuilders can establish a strong foundation and gain valuable experience, leading to improved competitiveness in the global market.

4.5.2 DEFENCE SHIPBUILDING

The Indian defence sector is a major opportunity for the shipbuilding industry. The Indian Navy has ambitious plans to enhance its fleet strength and capabilities through the construction of various types of warships, including frigates, destroyers, submarines, and aircraft carriers. The government's "Make in India" initiative, which encourages domestic manufacturing and defence production, further supports the growth of defence shipbuilding. By catering to the defence sector's requirements, Indian shipbuilders can secure long-term contracts and develop advanced technological capabilities.

4.5.3 OFFSHORE INDUSTRY

The offshore industry, including offshore oil and gas exploration and production, offers promising opportunities for the Indian shipbuilding industry. As offshore exploration activities increase, there is a demand for specialized vessels such as drill ships, FPSOs (Floating Production, Storage, and Offloading), and support vessels. Indian shipbuilders can capitalize on this demand by investing in the construction of technologically advanced offshore vessels and collaborating with international players to transfer technology and expertise.

4.5.4 GREEN AND SUSTAINABLE SHIPPING

The global shipping industry is increasingly focusing on environmental sustainability and reducing carbon emissions. This shift opens up opportunities for Indian shipbuilders to develop and construct eco-friendly and energy-efficient vessels. By adopting innovative technologies such as LNG (liquefied natural gas) propulsion, hybrid systems, and alternative fuels, Indian shipbuilders can position themselves as leaders in green shipping and cater to the growing demand for environmentally conscious vessels.

4.5.5 SHIP REPAIR AND MAINTENANCE

India has the potential to become a hub for ship repair and maintenance activities. With its strategic location and competitive labour costs, India can attract shipowners and operators for repair and dry-docking services. By investing in modern dry docks, upgrading repair facilities, and offering reliable and cost-effective services, Indian shipyards can capture a significant share of the ship repair market, both domestically and internationally.

4.5.6 SKILL DEVELOPMENT

India has a vast pool of talented engineers and skilled workforce. By focusing on skill development initiatives and establishing specialized training institutes, the shipbuilding industry can enhance the skill sets of its workforce. This will enable Indian shipbuilders to undertake complex and technologically advanced projects, attracting more business from global clients.

4.5.7 INTERNATIONAL COLLABORATION

Collaborating with international shipbuilders, technology providers, and investors can offer significant opportunities for the Indian shipbuilding industry. Joint ventures, technology transfers, and knowledge sharing can help Indian shipbuilders gain access to advanced technologies, improve efficiency, and enhance their global competitiveness.

In conclusion, while the Indian shipbuilding industry faces infrastructure challenges, it also possesses several opportunities for growth and development. By focusing on domestic demand, defence shipbuilding, offshore industry, green shipping, ship repair, skill development, and international collaboration, India can leverage these opportunities to strengthen its position in the global shipbuilding market. With the right policies, investments, and strategic initiatives, India can become a major player in the shipbuilding industry and contribute to the country's economic growth and employment generation.

CHAPTER 5

FINDING, SUGGESTIONS AND CONCLUSION

5.1 FINDINGS

Based on the study the following findings are listed:

1. Growth Potential: The shipbuilding industry in India has significant growth potential due to the country's long coastline, expanding maritime trade, and increasing domestic demand for ships. The government's focus on promoting the "Make in India" initiative and the defense sector's requirements present opportunities for the industry to expand and contribute to the country's economy.

2. Infrastructure Challenges: One of the major findings in the shipbuilding industry in India is the lack of infrastructure, including outdated shipyards, limited dry docks, insufficient port facilities, and inadequate transportation networks. These infrastructure deficiencies have hindered the industry's growth, resulting in delays, increased costs, and reduced competitiveness.

3. Defence Shipbuilding: The Indian defence sector offers significant opportunities for the shipbuilding industry. The government's emphasis on indigenization and self-reliance in defence manufacturing has led to the construction of various types of warships, submarines, and aircraft carriers in Indian shipyards. This focus on defence shipbuilding can drive technological advancements and provide long-term contracts for shipbuilders.

4. Offshore Industry: India's offshore industry, including offshore oil and gas exploration and production, presents opportunities for shipbuilding. There is a demand for specialized vessels, such as drill ships, FPSOs, and support vessels, to support offshore activities. Indian shipbuilders can tap into this market by investing in advanced technologies and collaborating with international players.

5. Skilled Workforce: The availability of a skilled workforce is crucial for the shipbuilding industry. India's pool of talented engineers and skilled workers provides a competitive advantage. However, skill development initiatives and specialized training programs are needed to enhance the workforce's capabilities and cater to the industry's evolving requirements.

6. Green and Sustainable Shipping: The global shift towards environmentally sustainable practices in the shipping industry presents an opportunity for Indian shipbuilders. The adoption of eco-friendly technologies, energy-efficient vessels, and alternative fuels can position Indian shipbuilders as leaders in green shipping.

These findings highlight both the problems and opportunities in the shipbuilding industry in India. While infrastructure deficiencies pose hurdles, areas such as defence shipbuilding, offshore industry, skilled workforce, and sustainable shipping offer prospects for growth and development. It's important to conduct detailed research and analysis for specific project findings and the most up-to-date information on the subject.

5.2 SUGGESTIONS

Strengthen Research and Development (R&D) capabilities to foster innovation, improve vessel design, and optimize manufacturing processes. Invest in modern infrastructure and advanced technology to enhance productivity and quality standards. Establish strategic partnerships with international shipyards and maritime technology providers for knowledge sharing and technology transfer.Collaborate with academic institutions to develop specialized courses and training programs for skilled workforce development. Promote a favourable regulatory environment and provide incentives to attract investments in shipbuilding. Encourage domestic shipowners to order vessels from Indian shipyards to boost domestic demand. Enhance marketing and branding efforts to showcase Indian shipyards' capabilities globally. Implement sustainable and eco-friendly practices to align with global environmental standards. Strengthen the supply chain by promoting indigenization and local manufacturing of shipbuilding components. Foster collaboration between government agencies, shipyards, and industry associations to address common challenges and promote growth.

5.3 CONCLUSION

The project on shipbuilding in India highlights the statistics of the Indian ship building companies in terms of orders, deliveries and capacities of Indian shipbuilding companies the stats clearly states that there is a requirement of participation of the private companies in Indian ship building industry. It also highlights problems and opportunities in the industry. The lack of infrastructure, including outdated shipyards, limited dry docks, inadequate port facilities, logistical challenges, and a shortage of skilled manpower, has hindered the growth and competitiveness of the Indian shipbuilding sector.

However, there are several opportunities for the industry to thrive. The domestic demand for ships, particularly in the defence sector and the growing offshore industry, presents significant growth prospects. Additionally, the focus on green and sustainable shipping, the potential for

ship repair and maintenance services, and the availability of a skilled workforce provide avenues for development.

To maximize the potential of the Indian shipbuilding industry, there is a need for concerted efforts from the government, industry stakeholders, and policymakers. Investments should be made to modernize shipyards, expand dry dock capacities, improve port infrastructure, and enhance the transportation network. Skill development initiatives and collaborations with international players can further strengthen the industry's capabilities.

By addressing the infrastructure challenges and capitalizing on the opportunities, India can position itself as a competitive player in the global shipbuilding market. The growth of the shipbuilding industry will not only contribute to the country's economic development but also generate employment opportunities and establish India as a hub for shipbuilding, repair, and maintenance services.

It is crucial for all stakeholders to work together to create an enabling environment that fosters innovation, promotes technological advancements, and supports the growth of the shipbuilding industry. With the right strategies and investments, India has the potential to become a prominent player in the global shipbuilding sector and contribute significantly to the maritime industry's growth and development.

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